ENGINEERING UPDATE

JULY 2012 - **VOLUME 7**

THIS PACKAGE INCLUDES A COLLECTION OF ARTICLES FROM VOLUME 7 OF THE JULY 2012 ENGINEERING UPDATE.

TABLE OF CONTENTS:

ENGINEERING UPDATE

July 2012 | **Vol. 7**

SPECIFYING FOR ACTUAL PERFORMANCE

By Cleve L. Doyen,
Noise Control Product Manager

Engineers can face significant challenges when specifying silencers, including limited time and a lack of support from knowledgeable sources. There is a common misconception that a silencer is simply a piece of duct with baffles, and this perspective can lead to compromised performance simply based on a lack of understanding.

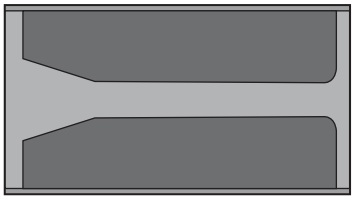
INTERIOR PROPERTIES

A common practice in silencer specification is to list cataloged performance data on a schedule.

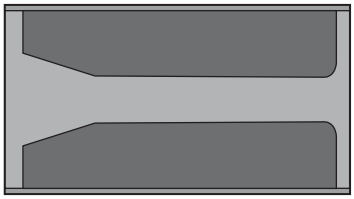
What is typically not considered is that several manufacturers' catalog performance is based solely on tested silencers with a 24 in. width. The thickness of the silencer baffles and the width of the air passage have a significant effect on performance. For example, a 40 in. silencer with a single air passage can differ from a 24 in. silencer by more than 10dBa at different frequencies **(Figure 1)**.

Another common error is specifying a polymer lining in a specification while annotating standard silencer performance in the schedule without understanding that this lining can reduce performance by up to 30%.

Selecting silencers through manufacturers' software, such as Price All-in-One (AIO), will ensure that all products are correctly configured to meet the precise performance requirements of the project. Price AIO software only requires dominant frequency, whether low or mid-high, to select noise control products and tests to the 2006 (most recent) ASTM E477 revision, so all data is published in accordance with that standard.



63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
3	11	20	28	29	19	12	10



63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
8	10	13	17	13	11	10	10

Figure 1: Performance of a 40 in. silencer compared to a 24 in. silencer

TESTING STANDARDS

The most common standard to which silencers are specified and tested for performance in North America is ASTM-E477. What most do not realize is a significant change was made to the specification in 1999 to provide greater accuracy in documented performance as well as elbow testing. Revisions to the standard's testing processes over the years have resulted in significantly disparate documented performance between revisions. For example, a silencer tested under the 1996 revision and the 1999 revision can show a difference of more than 4dB at 250 and 500Hz based solely on the 1/3 octave band combination formula, which could misrepresent manufacturers' provided submittal data as meeting the designer's expectations. **Prior to the 1999 revision, ASTM E477 did not include a specification for testing elbows; the design of the testing process was, instead, left up to individual judgement.**

It is recommended that design specifications be updated to include the latest revision of ASTM E477. As a simple check of submittals, ensure the revision year is annotated; for example, "tested according to ASTM E477-06a."

To learn more about how to protect yourself against ambiguity in your specification of ASTM E477 performance data, please see Price's most recent Noise Control white paper, **A Common Loophole in Silencer Testing.**

EXTERIOR CASING

Some manufacturers have recently begun using the term "HTL Equivalent to 8ga" or simply "HTL Equivalent" to describe the exterior casing of a silencer.

Industry conventions for outside casings are 22ga, 18ga, 16ga, or 10ga; cladded casings such as 18ga outer with a 2 in. liner and 10ga outside shell go a step further in managing breakout performance, such as in silencers preserving an STC 55 rated barrier.

"HTL Equivalent to XX" is typically interpreted to mean that the amount of sound energy radiating from the silencer casing would be "equivalent to" the radiated sound of an equivalent length of unlined duct of the implied gauge. The actual silencer casing would be lighter than the "equivalent to" gauge due to the reduction of the sound levels within the silencer. This "HTL Equivalent to XX" strategy is used to introduce ambiguity and confusion into the project specification, causing competitors and their sales representatives to increase the amount quoted to verify safety.

To combat this in a project where multiple manufacturers may be bidding, the engineer should specify only the industry conventional gauges of 22ga, 18ga, 16ga or 10ga and cladded models.

SPECIFICATION REVIEW

These issues are just a few of many that can cause confusion as to what is being specified by an engineer. Price's goal is to aid in the development of these specifications by reviewing them to identify ambiguity or misconceptions and suggesting alternatives to tighten the specification against any potential loopholes or outdated information. All suggestions are listed in red and are editable in Microsoft Word so that the suggestions made are clear and can be accepted or discussed as required.

Please contact your local Price Representative or **Cleve Doyen**, Product Manager for Noise Control, to set up your Master Specification review.

ENGINEERING UPDATE

July 2012 | **Vol. 7**

PRODUCT FEATURE: RADIAL TWIST DIFFUSER (RTD)

The Price RTD is a high performance, moderately priced alternative to traditional high-induction, mixing diffusers. Quiet, efficient and economical, this high induction twist diffuser is perfectly suited for a variety of applications, including patient waiting rooms, exam rooms, labs, hallways, offices, and other spaces that require low NC values, high air change rates and a draft-free thermal environment.

Traditional pattern diffusers with mixing vanes generate noise, and like the twist diffusers of European design, can be expensive. The RTD provides superior mixing characteristics, high air flow capabilities and very low noise generation—all at a very attractive price point.

AIR MIXING CAPABILITIES

- Contributes to increased occupant comfort by ensuring a draft-free environment and more uniform temperature throughout the occupied space.
- Shortest throws on the market: Up to 25% shorter at 50 fpm than other diffuser types.

QUIET PERFORMANCE

- NC values up to 45% lower than competing diffusers.
- Acoustically outperforms plaque (SPD) and square cone (SCD) diffusers.

HVAC SYSTEM EFFICIENCY

- Low static pressure (even lower than the square cone diffuser, long considered the “king” of low static pressures) can contribute to improved system efficiency and annual operating cost savings.
- Performs well in VAV systems, even at low turn-down rates.

GREAT VALUE

- Most economical solution among twist and other high induction ceiling diffusers.

SPECIFY THE PRICE RTD ON YOUR NEXT PROJECT AND GET UNMATCHED PERFORMANCE, EFFICIENCY AND COMFORT!